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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 93-055
UPDATED WASTE DISCHARGE REQUIREMENTS

WASTE MANAGEMENT OF CALIFORNIA, INC.
KIRBY CANYON RECYCLING AND DISPOSAL FACILITY,
CLASS III SOLID WASTE DISPOSAL SITE
SAN JOSE, SANTA CLARA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board), finds that:

Waste Management of California, Inc. (WMC) (hereinafter called the discharger) owns and operates the Kirby Canyon Recycling and Disposal Facility (KCRDF), a Class III municipal refuse disposal site located in the City of San Jose, Santa Clara County.

PURPOSE OF UPDATE ORDER:

1. In February, 1993, Waste Management of California, Inc. submitted a Report of Design (Equivalent to a Report of Waste Discharge) requesting updated Waste Discharge Requirements (WDR's) establishing design specifications for waste Cells 2 and 5.

   This order primarily updates the groundwater monitoring program and liner requirements for the Kirby Canyon landfill operation consistent with the requirements of Article 5, Title 23, Division 3, Chapter 15 of the California Code of Regulations and the provisions of Title 40 Part 258 of the Code of Federal Regulations (Subtitle D).

SITE DESCRIPTION

2. The site is located adjacent to the southeastern portion of the Santa Clara Valley on the west side of the Diablo Range on land within the southern boundary of the City of San Jose (Figure 1). Access to the site is from the Scheller Avenue interchange on U.S. Highway 101 and from there along the private access road which runs southeast from the interchange, approximately 0.8 mile, to the project lease boundary.

3. Figure 2 represents the topography existing at the landfill as of July 1992. The natural site topography varies from moderate to steep elevations ranging from about 400 feet above Mean Sea Level (MSL) along the west side of the site to nearly 1300 feet above MSL along the east boundary. The landfill is located on the west side of a prominent ridge line and encompasses three major canyons.

4. The property on which the KCRDF is located is leased from Castle & Cooke Development Corporation. The total 827 acre

parcel is composed of: 760 acres of which approximately 311 acres will be utilized for refuse disposal purposes; an additional 50 acre area which provides the landfill access road easement and a potential borrow area; and an additional 17 acre area for drainage control and a construction easement.

5. The 311-acre permitted disposal area footprint consists of five disposal areas referred to as Fill Areas 1 through 5 (as shown in Figure 3). Currently refuse is being accepted in Cell 1 of Fill Area 1. The Kirby Canyon Recycling and Disposal Facility (KCRDF) operates as a canyon-fill and is constructed in intermediate phases until the ultimate configuration is reached.

6. Approximately one million cubic yards of waste have been deposited at the landfill since operation began in 1986. The containment system for the existing unit (Cell 1) consists of a hydraulic barrier composed of a toe berm and grout curtain constructed at the toe of the fill and a dendritic type leachate collection and springwater interceptor system. The discharge pipes for the springwater and leachate collection systems were subsequently joined together when at least one of the springwater interceptor systems became contaminated. The sealing processes to maintain a minimum five-foot separation between the refuse and the system intakes may have been ineffective, and/or leaks may have allowed leachate to enter into a springwater drain pipe(s). The leachate/springwater mixture from Cell 1 gravity drains via a main transport pipe to a truck load-out stand and to the on-site leachate treatment plant. The leachate/springwater mixture is stored in aboveground, enclosed tanks when the plant is not in operation.

7. Cells 2 and 5 of Fill Area 1 cover 36 acres of the first major canyon. The interim fill plan for these cells provides approximately 4.29 million cubic yards of airspace. Based on a refuse to cover ratio of approximately 4 to 1, a compacted refuse density of approximately 1300 lb/cubic yard (c.y.) or 0.65 tons/c.y., and an average throughput rate of the refuse of approximately 1800 tons/day, the service life of the cells will be approximately 4 years. These two cells will receive additional refuse fill to final grades in the future as the adjoining areas are developed.

HISTORICAL BACKGROUND

8. On August 30, 1984, the City of San Jose's Department of Neighborhood Preservation, acting as the local enforcement agency (LEA) to the California Integrated Waste Management Board issued the "Operating Permit for Facilities Receiving Solid Waste" [Solid Waste Facilities Permit (SWFP) Number 43-AN-008]. Subsequently, the SWFP was modified and reissued on November 10, 1992 to reflect minor changes in operation which had occurred since the 1984 SWFP was issued.

9. On May 15, 1985, the San Francisco Bay Regional Water Quality Control Board adopted Waste Discharge Requirement (WDR) Order No. 85-47, which authorizes KCRDF's operation as a Class III solid waste management facility.

10. The sanitary landfill provides disposal services for communities within the County of Santa Clara.

11. The discharger submitted a report entitled "Report of Design Cells 2 and 5" prepared by Bryan A. Stirrat & Associates, Inc. in February, 1993. The contents of the subject report describe the design and construction to be implemented in development of Cells 2 and 5 within Fill Area 1 of KCRDF, and the general inspection and operating procedures for the entire site. In addition, the intent of this report is to facilitate the approval of updated Waste Discharge Requirements (WDR's) for the facility.

12. The discharger submitted a report entitled "Proposed Monitoring and Reporting Program for: Kirby Canyon Recycling and Disposal Facility" prepared by SEC Donohue in June, 1992 pursuant to provisions of Article 5 of Chapter 15. In March, 1993 the discharger submitted a revised report to incorporate the waste management units to be constructed in the near future (Cells 2 through 5) into the groundwater monitoring network.

13. On March 9, 1993, the discharger was issued Water Quality Certification for wetland mitigation under Clean Water Act Section 401 subject to the conditions contained in Board Resolution 93-017.

GEOLOGIC SETTING OF THE SITE

14. The landfill is located in a massive extrusion of Serpentine rock which protrudes upward from deeper geologic strata and extends horizontally at least 1500 feet to the east and 600 feet to the west of the permitted disposal area footprint.

15. The serpentine formation is bounded on the northeast by the Silver Creek fault and on the southwest by the Coyote Creek fault. The closest Holocene fault is the Calaveras fault located 1.8 miles northeast of the site. The San Andreas, which is located approximately 11.4 miles southwest of the site, and Calaveras faults have had extensive historic earthquake activity.

16. The serpentinite body at the site is offset by a series of northwest striking, predominantly strike-slip, faults (EMCON, 1983, 1989). The Plio-Pleistocene Santa Clara Formation is found east and west of the KCRDF in fault contact with the serpentinite. The Santa Clara Valley is underlain by up to 1800 feet of the Plio-Pleistocene Santa Clara Formation sediments and Quaternary alluvium.

17. According to Golder Associates, Inc. (1993), ten primary faults within the San Andreas system (including the San Andreas fault zone) occur within about 36 miles of the KCRDF. These faults have been identified as potential earthquake sources for the purposes of the Maximum Credible Earthquake (MCE) evaluation. Location of these faults is shown in Figure 4.

18. The geology in the area of Cells 2 and 5 consists of serpentine bedrock generally overlain by a thin veneer of residual, alluvial, and colluvial soil referred to as the alluvial unit. The residual soil occurs mainly beneath the ridges and upper side slopes, while colluvium underlies the lower side slopes and fills swales and gullies. Alluvium is restricted to the valley bottoms. The surface soils are derived from the serpentinite and are relatively thin on the ridge tops and slopes (0.3-1.5 m; 1-5 feet) and thicker in gully bottoms (3-10+ feet).

19. Underlying the alluvial unit is weathered serpentine bedrock which occurs at depths of approximately 20 to 30 feet in the valley areas and approximately 100 feet on or near ridge tops. This formation is composed of gray, weathered serpentinite with numerous iron-stained and clay-filled fractures. The weathered serpentinite interval is in turn underlain by unweathered serpentinite which extends to depths in excess of 200 feet. This unweathered bedrock is composed of dark green to blue-gray, highly plastic to well indurated serpentinite.

20. Results of data from point load and unconfined compressive strength testing of rock core from Cells 2 through 5 indicate a wide range of compressive strengths. The unweathered bedrock zone tends to exhibit local areas of rock competency whereas other zones have been characterized as weak and/or brecciated. This variability of lithology within the unweathered bedrock is explained by the fact that the serpentinite formation is a metamorphic alteration of an already-existing host rock.

21. Results from several studies show that fracturing within the weathered and unweathered bedrock zones do not represent significant preferential groundwater migration pathways. Numerous hydraulic tests have not revealed joint fractured orientations resulting in increased groundwater flow, and inspection of drill hole core samples indicate that fractures are infilled by alteration and/or depositional clay-sized material. Recent geophysical studies indicate that fractures within the weathered serpentinite bedrock interval above the existing water table are also largely infilled.

22. One landslide was identified within the Cells 2 and 5 area during field mapping. The landslide was located in the northwest corner of Cell 2 and is reported to be a shallow surface soil failure less than 10 feet thick that has a distinct head scarp on a slope of 40 to 50 degrees. Because of

its shallow nature, it is expected to be removed completely during the subgrade excavation.

HYDROGEOLOGY

23. Groundwater occurs in all three lithologic units present at the site. Limited quantities of shallow groundwater are found in the weathered zone in the serpentine formation underlying the site. This shallow groundwater is of generally good quality for most uses; however, the high total dissolved solids content makes the groundwater unacceptable as a drinking water supply. Water balance and flow calculations indicate that the alluvial zone provides approximately 95% of the groundwater flow through the first major canyon in which the current fill area is located. Of the remaining 5% of groundwater flow, approximately 4% occurs within the weathered serpentinite unit, and the remaining approximately 1% occurs within the unweathered serpentine bedrock. The pH of the groundwater increases with depth from approximately 7.9 to 9.6 units in the alluvial and weathered bedrock zones (Magnesium bicarbonate type water) to approximately 10 to 12 units in the unweathered serpentine bedrock (Calcium hydroxide type water).

24. Groundwater flow decreases dramatically from the alluvium to the unweathered serpentinite. Hydraulic conductivities have been estimated to be about $1x10^{-4}$ cm/sec or greater in the alluvial water bearing zone, in the range of $1x10^{-5}$ cm/sec in the weathered serpentinite zone, and approximately $1x10^{-6}$ to $1x10^{-9}$ cm/sec in the unweathered bedrock zone. Groundwater flows in a westerly and southwesterly direction along the first major canyon (in which the current fill area is located) toward the Santa Clara Valley. The Coyote Creek Fault, which separates the serpentinite from the Santa Clara Formation to the west, may act as a barrier to groundwater flow. The serpentinite bedrock and adjacent Santa Clara Formation are characterized by very low hydraulic conductivities that provides significant hydraulic separation between the landfill and the Santa Clara Valley Alluvium. The Santa Clara Valley Alluvium contains aquifers which are a heavily used source of groundwater. Groundwater flow from the serpentine materials beneath the KCRDF intersect the Santa Clara Valley Alluvium north of this divide.

25. Groundwater samples from the site indicate that younger and, therefore, less mineralized groundwater is present along ridgetops above the Cells 2 through 5 area. Older, more mineralized groundwater is present in the lower canyon area near the toe of the existing landfill. The hydrogeochemistry results support the scenario that the up-canyon bedrock areas represent areas of groundwater recharge, while the vertical upward gradients and more mineralized groundwater in the vicinity of the canyon bottom represent areas of bedrock groundwater discharge.

2/5 specific

26. Groundwater in the Cells 2 to 5 area is approximately 70 to 100 feet below the surface along ridge lines and 5 to 20 feet below the surface in canyon floors. One low flow spring was mapped near the center of Cell 2.

27. Background water quality levels for many indicator parameters have been established from analysis of water samples taken quarterly for the past year from the shallow alluvial zone in the serpentine formation. Weathered bedrock groundwater is to be evaluated over the course of one year subsequent to emplacement of monitoring wells MW-WB1 and MW-WB2.

28. Municipal and private wells serving the San Jose area are located in the Santa Clara Valley Alluvium; the closest wells are approximately 1 mile northerly of the site.

29. Beneficial uses of groundwater in the vicinity of the site in southern Santa Clara Valley and the Coyote Creek and Coyote Canal are:

    a. Municipal and domestic water supply
    b. Industrial process water supply
    c. Agricultural supply
    d. Water contact recreation
    e. Non-contact water recreation
    f. Warm fresh water habitat
    g. Cold fresh water habitat
    h. Wild life habitat
    i. Preservation of rare and endangered species
    j. Fish migration
    k. Fish spawning

SURFACE HYDROLOGY

30. Runoff from the KCRDF site currently flows into the Santa Clara Valley Water District's Coyote Canal. Both this Canal and nearby Coyote Creek, serve as recharge zones for the Santa Clara Valley Alluvium.

31. The mean annual precipitation for the site is calculated to be 19.5 inches. The 100 year, 24 hour storm event is estimated to be 8.2 inches and the probable maximum precipitation, 15.7 inches. The mean annual evaporation is estimated to be 41.1 inches.

WASTES AND THEIR CLASSIFICATION

32. The facility receives nonhazardous residential, commercial and industrial solid waste.

33. The facility is permitted to receive several types of nonhazardous waste (special waste) which may require special handling. These wastes include the following:

a. Non-liquid water treatment residue such as solids from screens and settling tanks, and sludge containing at least 20% solids.

b. Non-liquid sewage treatment residue such as solids from screens and grit chambers, and sludge containing at least 20% solids.

c. Ashes from household burning.

d. Triple rinsed pesticide containers in accordance with Title 22, CCR, Section 66261.7.

e. The facility also receives inert materials which can be used for the construction of a winter deck and maintenance of the internal roads of the landfill.

34. Effective October 9, 1993, recirculation of leachate and gas condensate will be limited to areas of the landfill that are 1) equipped with a composite liner and a leachate collection system and 2) limited to the unit of the landfill from which derived. Leachate collected from the existing unit, Cell 1, may be discharged to a different waste management unit upon approval of the Board per Section 2543(g) of Chapter 15.

DESIGN OF WASTE MANAGEMENT UNIT

35. The KCRDF is situated on a formation where geologic and hydrogeologic conditions alone do not prevent impairment of groundwater. The site does not meet the current geologic siting criteria because shallow groundwater exists in the canyons which could potentially enter the waste. Under such circumstances Section 2530(c) of Chapter 15 requires a minimum 5 foot separation between waste and groundwater. The proposed design is intended to address this condition by including: (1) a groundwater sub-drain to intercept the springs and any other groundwater on the site and convey it for discharge downgradient of the facility, and (2) by including a composite liner and leachate collection system to assure that wastes are contained within the landfill.

36. The majority of the Cells 2 and 5 development area will require excavation, although a small portion of the footprint will require engineered fill to achieve the design sub-grade. The bottom area has an average slope of seven percent and is graded to drain down to two main swales in which the leachate collection and removal system main collectors will ultimately be placed. The cells will be constructed generally with a 1.5:1 side slope between 20 foot wide benches placed approximately every 40 vertical feet (Figure 5). The elevation of the sub-grade excavation ranges between approximately 860 feet Mean Sea Level (MSL) at the lowest elevation to 1,160 feet along the eastern perimeter boundary.

37. The subdrain system will include a primary and a secondary collection system. All sub-drain collection system components are to be installed underneath the low permeability composite liner (Figures 5, 6, 7, 8) and are upgradient and independent of the Cell 1 springwater interceptor system. In the future, the subdrain discharge from Cells 2 and 5 will tie into the subdrain collection system for Cells 3 and 4 (the subsequent unit to be constructed).

    a. The primary collection system consists of a combination dendritic pipe and continuous gravel blanket system along the base of the cells which has a minimum slope of approximately 6%. A dendritic series of six inch diameter perforated groundwater collection pipes will be placed in drainage rock in a geotextile lined trench excavated below exposed sub-grade. This dendritic sub-drain pipe system will be spaced uniformly throughout the base area of Cells 2 and 5 and will free drain to a single main collector line at the discharge outlet. A 12-inch layer of sub-drain gravel with overlying and underlying geotextiles will then be placed over the entire base grade portion of the Cells 2 and 5 excavation area (Figure 6). The subdrain collection system outlet will free drain into the adjacent, existing perimeter surface water drainage ditch located upgradient of Cell 1 which discharges to existing sedimentation basin "A". The subdrain discharge will be monitored as required in the Discharge Monitoring Program.

    b. The secondary collection system consists of a mechanical backdrain and a series of toe drains installed on the side slopes. In general, this mechanical backdrain system consists of a geonet drainage layer placed below the low permeability soil component of the liner and against the finished sub-grade. The toe drains will be installed along the flowline of each bench and will consist of 4 inch diameter perforated pipes in geotextile-lined drain gravel. The toe drain pipes will drain parallel to the benches at a minimum slope of approximately 2% toward collector lines along the cell perimeters which convey the collected groundwater to a central drainage pipe at the discharge outlet (as shown in Figure 7).

38. In accordance with Article 5 of Chapter 15, a vadose zone monitoring system (VZM) is to be constructed beneath future waste management units. The VZM system will consist of a collection pan lysimeter system placed in the constructed unsaturated zone beneath the portion of the unit where leachate accumulation is most likely to occur (e.g. sumps or central collection pipes). For Cells 2 and 5, which do not incorporate a leachate collection sump, the lysimeter will be constructed in a "V" shape immediately below the composite liner, beneath the entire length of the main leachate collector lines in the base area (Figure 8). The VZM system consists of four inch slotted pipe in geotextile-lined

granular drainage material underlain with a flexible membrane liner. The VZM system collection pipes will gravity drain at an average slope of approximately 7% to ensure that there is rapid detection of fluid within the system. The lysimeter outlet will gravity drain to a designated holding tank located at the perimeter of Cells 2 and 5, and the vadose zone discharge will be monitored as required in the Discharge Monitoring Program. In the future, the lysimeter outlet from Cells 2 and 5 will tie into the VZM system for Cells 3 and 4 (the subsequent unit to be constructed).

39. The composite lining system for the KCRDF will consist of an 80-mil thick High Density Polyethylene (HDPE) Flexible Membrane Liner (FML) over a minimum two-foot thick compacted low-permeability (less than $1x10^{-7}$ cm/sec) soil liner (Figure 8).

40. The leachate collection and removal system (LCRS) for Cells 2 and 5 includes a continuous gravel blanket, main and lateral dendritic collection lines and cleanout pipes. All LCRS components are to be installed above the composite liner (Figures 6, 7, 8, 9) and are upgradient and independent of the Cell 1 leachate collection system. In the future, the outlet from Cells 2 and 5 will tie into the LCRS for Cells 3 and 4 (the subsequent unit to be constructed).

    a. In the base area, which has a minimum slope of approximately 6%, the main collector lines and the base laterals will be placed in a 12 inch layer of LCRS gravel. The dendritic series of six inch slotted lateral pipes will convey the leachate to the eight inch slotted and solid wall main collector pipes. The main collector will discharge by gravity flow into double-contained storage tank(s) located at the perimeter of the cells from which the leachate will be pumped and transported via truck to the existing leachate treatment facility. The LCRS discharge will be monitored as required in the Discharge Monitoring Program.

    b. On the sideslopes, six inch slotted lateral collection pipes will be placed in a 12 inch layer of gravel near the flow line of each bench. These laterals will drain parallel to the benches at a minimum slope of approximately 2% toward collector lines along the cell perimeters which convey the leachate to the main collector pipes at the discharge outlet.

    c. The cleanouts will be eight inch solid wall pipes which will run down the sideslopes at 1.5:1, cross the benches at 2%, and connect to one of the laterals in the base area.

SLOPE STABILITY

41. As part of the geotechnical evaluation and design, the discharger evaluated the static and dynamic (seismic) stability of the subject landfill. The results are summarized below:

a. Static Slope Stability

Two dimensional static and dynamic stability analyses were conducted to evaluate the stability of various refuse fill and excavation slope configurations for Cells 2 and 5. The stability analyses were computed using Janbu's method of slices using the computer program XSTABL (Version 4.1). The stability analyses were conducted on waste fill and excavation cross-sections considered to be most critical from the stability stand point, and in the context of the two dimensional analyses. According to the results of the waste fill stability analyses, the proposed design and construction will meet appropriate static and seismic stability criteria. These criteria are:

1. A minimum factor of safety of 1.5 under static conditions, and

2. Maximum deformations of 4 to 6 inches during a maximum credible earthquake (MCE) at the site.

b. Pseudo Acceleration for Dynamic Slope Stability Analysis

The peak pseudo accelerations were determined at the bottom of the landfill mass. The maximum ground acceleration estimated at the site, from a potential earthquake source, located less than 10 km from the site, is estimated to be 0.63g. The SHAKE program was used to perform the dynamic response analysis for the site with 80 feet of waste resting on the bedrock, subjected to bedrock acceleration from the near field and far field seismic events.

Results of the horizontal yield acceleration evaluation indicated that the maximum deformation of the refuse slopes will be limited to a few inches (4 to 6 inches) if the yield acceleration of the refuse slope is equal to or more than 0.11g. These relative small displacements are not expected to adversely affect the performance of the liner or leachate collection and removal system.

The dynamic slope stability analyses were completed along the critical slope cross sections and failure surfaces determined from the static stability analysis. The results indicate that the maximum deformation will be less than or equal to the maximum design deformations of four to six inches.

c. Stability of Excavation Slopes

Based on kinematic and rotational type failure analyses of the excavation slopes, the landfill excavation slopes are stable under static and dynamic conditions. The static factor of safety is about 2.5 which exceeds the criterion of 1.5. The dynamic stability of the excavation slopes is conditional on the acceptance of negligible maximum deformations of the bedrock slopes on the order of four to six inches.

d. Seismic Stability

Chapter 15 requires that "Class III waste management units be designed to withstand the maximum probable earthquake without damage to the foundation or to the structures that control leachate, erosion, or gas". Ten potential sources (Table 1) were identified that could affect the site in terms of earthquake strong motions. These sources are as close as 1 km (the Coyote and Silver Creek faults) from the area of Cells 2 and 5 and as far as 56 km (the San Gregorio fault) and have potential MCEs ranging from magnitude M_s 6.7 to 8.5.

The MCEs occurring on these sources could induce mean horizontal accelerations in rock at the site with a range of 0.03 to 0.63g. The MCE mean peak horizontal acceleration in the rock for design is estimated to be 0.63g. This would be termed a near field acceleration and is associated with a magnitude M_s 7.2 earthquake on the Calaveras fault located about 3.0 km from the site. A far field MCE acceleration of 0.47g was also considered in the dynamic stability analysis and was derived from a magnitude M_s 8.5 earthquake on the San Andreas fault located at a distance of 19 kilometers from the site. The duration of strong motion from the near field sources is estimated to be in the range of 26 to 31 seconds, and that from the far-field MCE source would be greater than or equal to 35 seconds.

The design data indicates that the landfill liner is sufficient to withstand deformation of up to 1 foot (the proposed clay liner is two feet thick). Thus, based on the seismic stability analysis and the requirement for a detailed Post Earthquake Inspection Plan, the Board finds that the seismic slope stability analysis is acceptable.

MONITORING PROGRAM

42. The discharger proposes a monitoring and reporting program to comply with water quality protection standards pursuant to Article 5, Section 2550(a). The discharger is required to implement the monitoring points introduced under Part B of the Discharge Monitoring Program.

43. The Order requires the discharger to monitor the vadose monitoring system (pan lysimeter) in addition to leachate, surface and groundwater within the site. The unsaturated zone monitoring program shall be conducted to comply with the requirements of Article 5, Section 2550(7).

44. The discharger shall analyze for the parameters as presented in Table 2 of the Discharge Monitoring Program for the KCRDF for a period of one year. Following this one-year period, a subset of the parameters cited in the Table 2 list shall be proposed for acceptance by the Board as Constituents of Concern (COC) per Section 2550.3 of Chapter 15, and a subset of the parameters in the COC list shall be proposed for acceptance by the Board as detection monitoring parameters per Section 2550.8 (e) of Chapter 15. The criteria for selection of the detection monitoring parameters are detectability, persistence, existence in the site's leachate, mobility, and contrast to surrounding groundwater.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

45. The City of San Jose certified a final Environmental Impact Report dated September 15, 1983 for the 827-acre Kirby Canyon landfill project in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et. seq.). It is intended that the findings, prohibitions, specifications, and provisions of this Order be consistent with the certified final Environmental Impact Report.

46. The final Environmental Impact Report found that the proposed landfill and landfill activity, as approved by the City, could cause significant effects on water quality and may degrade the water quality unless appropriate mitigation measures are taken. In general, potential impacts to the water quality could occur as a result of:

    a. Earthquake damage or failure of leachate collection systems;

    b. Slope instability or failure as a result of water saturation;

    c. Potential degradation of surface water quality as a result of increased sediment load and/or erosion;

    d. Potential groundwater contamination due to contact with leachate;

    e. Potential downstream impacts to aquatic biota from accidental discharge of contaminated water;

    f. Alteration of existing surface and groundwater flow.

47. Sanitary landfills could potentially impact groundwater if not properly designed and operated. Corrosiveness and hardness of the groundwater may result if the products of the decomposed refuse come in contact with the groundwater. Groundwater can also be affected by water that percolates through waste materials and extracts or dissolves substances from it and carries them into the groundwater.

48. No significant impact on the quality of surface water is expected due to the sanitary landfill operation. There are no large bodies of water in the immediate vicinity of the site, and the site is not within a tidal zone or flood plain subject to inundation. There is a potential for runoff to become contaminated by contact with refuse during landfill operations.

49. The preceding impacts are mitigated or avoided by design measures to control erosion and assure containment of waste and leachate through the use of liners, leachate collection and removal systems.

50. The Board adopted a revised Water Quality Plan for the San Francisco Bay Basin (Basin Plan) amended on October 21, 1992. This Order implements the water quality objectives stated in that plan and its subsequent amendments.

51. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge, and has provided them with an opportunity to submit their written views and recommendations.

52. The Board in a public meeting heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED pursuant to authority in Section 13263 of the California Water Code, the discharger, its agents, successors and assigns may discharge waste at the Kirby Canyon Recycling and Disposal Facility providing compliance is maintained with regulations adopted under Division 7 of the California Water Code and with the following:

A. PROHIBITIONS

1. The disposal of waste shall not create a pollution or nuisance as defined in Section 13050(1) and (m) of the California Water Code.

2. Wastes shall not be placed in or allowed to contact ponded water from any source whatsoever.

3. Wastes shall not be disposed of in any position where they can be carried from the disposal site and discharged into waters of the State or of the United States.

4. Leachate from wastes and ponded water containing leachate or in contact with refuse shall not be discharged to waters of the State or of the United States.

5. Hazardous and designated wastes as defined in Sections 2521 and 2522 of Chapter 15, shall not be deposited or stored at this site.

6.. High moisture content wastes (those containing less than 50 percent solids) other than water treatment and waste waster treatment sludge shall not be discharged into the disposal area without prior approval by the Executive Officer. Such approval shall be granted only if there is adequate moisture holding capacity in the landfill based upon mass balances and previous monitoring of the relevant leachate control facility. A minimum solids to waste liquids ratio of 5:1 by weight must be maintained for the disposal operation overall. Furthermore, sludge shall not be discharged into the disposal area unless they contain at least 20 percent solids if primary sludge, or at least 15 percent solids if secondary sludge, or water treatment sludge.

7. The discharge of wastes which have the potential to reduce or impair the integrity of the containment structures or which, if commingled with other wastes in the unit, which could produce chemical reactions that create heat or pressure, fire or explosion, toxic by-products, or reaction products which in turn:

   a. require a higher level of containment than provided by the unit,

   b. are "restricted hazardous wastes", or

   c. impair the integrity of the containment structures.

8. Construction of the containment features of all future waste management units must be in compliance with this Order, Chapter 15 and Subtitle D. Wastes shall not be placed in any area of a new unit until the Executive Officer has received and approved report(s) certified by a California registered civil engineer or certified engineering geologist in accordance with Provision C.2 of this Order.

9. The discharger, or any future owner or operator of this site, shall not cause the following conditions to exist in waters of the State at any place outside the waste management facility:

   a. <u>Surface Waters</u>

      1. Floating, suspended, or deposited macroscopic particulate matter or foam.

2. Bottom deposits or aquatic growth.

3. Adversely alter temperature, turbidity, or apparent color beyond natural background levels.

4. Visible, floating, suspended or deposited oil or other products of petroleum origin.

5. Toxic or other deleterious substances to be present in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

b. Groundwater

The groundwater shall not be degraded as a result of the waste disposal operation.

B. SPECIFICATIONS

1. All reports pursuant to this Order shall be prepared under the supervision of a registered civil engineer, California registered geologist or certified engineering geologist.

2. Water used during disposal operations shall be limited to dust control, fire suppression and earth fill moisture conditioning.

3. The site shall be protected from any washout or erosion of wastes from inundation which could occur as a result of a 100-year 24-hour precipitation event, or as the result of flooding with a return frequency of 100 years.

4. Hazardous wastes, Designated wastes and Infectious wastes shall not be disposed of at this landfill. Non hazardous, Inert Wastes and Asbestos may be disposed of at this landfill provided that all regulations and provisions of the California Integrated Waste Management Board, California Department of Toxic Substance Control, Local Health Agencies and Local Land Use Permit requirements are complied with.

5. Permanent leachate control facilities shall be constructed as shown in discharger's "Report of Design Cells 2 & 5", Volume 1 submitted February, 1993. Measures shall be taken to ensure that the leachate extraction system for Cell 1 will remain operational permanently. All leachate collection and conveyance facilities shall be constructed to ensure free flow of leachate through

the pipeline into the treatment facility and into the treated leachate effluent storage pond.

6. All conveyance control facilities and hydraulic structures shall be constructed to ensure normal flow of liquid and to prevent hydraulic pressure buildup within the pipeline. All hydraulic structures shall be constructed according to the design and construction specifications as well as in accordance with Section 2545 of Chapter 15, and shall be completed prior to the placement of any refuse in the specified fill area.

7. The Cell 1 leachate collection and removal system shall be maintained and operated to prevent the buildup of hydraulic head against the grout curtain. This system shall be inspected monthly, and any accumulated fluid shall be removed.

8. A minimum of five foot separation zone between the highest anticipated elevation of underlying groundwater and the waste shall be kept during the life of the landfill. In the event that near surface springs in the fill areas continue to discharge water or remain wet up to the time of refuse filling, an interceptor sub-drain and/or a horizontal well system shall be installed to ensure dewatering of the affected area. Construction of the subject system shall be in compliance with Chapter 15.

9. A geologic map of the base of the excavation shall be prepared for each waste management unit as it is developed. Fractures or fracture zones or veins of serpentinite which might allow leachate to migrate into deeper geologic strata shall be clearly marked.

10. The discharger shall assure that the foundation of the site, the refuse fill, and the structures which control leachate, surface drainage, erosion and gas for this site are constructed and maintained to withstand conditions generated during the maximum probable earthquake.

11. The leachate collection and removal system (LCRS) shall be maintained and operated to prevent the buildup of hydraulic head on the bottom of the landfill. The maximum permissible leachate level buildup above the liner must not be greater than one foot. The LCRS shall be inspected monthly, and any accumulated fluid shall be removed.

12. As portions of the Class III landfill are closed, the exterior surfaces shall be graded to a minimum slope of 3 percent in order to promote lateral runoff of precipitation. In addition, all completed disposal areas shall be covered with a minimum of 4 feet of cover and in accordance with other applicable requirements as described in Article 8 of Chapter 15.

13. Landfill leachate prior to treatment shall be discharged to an above ground, secondarily contained, enclosed tank(s). The discharger must have sufficient number of tanks to keep a balance between leachate generation and leachate treatment for all the pertinent LCRS.

14. All future waste management units should be provided with composite liner components (synthetic liner with minimum thickness of 40 mils or at least 60 mils if of HDPE, and 2 feet compacted clay with permeability of no greater than $1x10^{-7}$ cm/sec as determined in compliance with Section 2541 (C) of Chapter 15) and a leachate collection and removal system. The proposed dendritic leachate collection system must meet the conditions specified in Section 2543 of Chapter 15.

15. The landfill shall be designed and constructed in conformance with Chapter 15 and this Order. The final design plans shall be submitted to the Executive Officer for review and approval and shall include, but not be limited to, the engineered design plans for the fill cell, the construction specifications, a construction quality assurance (QA/QC) plan, and a revised discharge monitoring program. The final construction report shall include, but not be limited to, construction record drawings (as-built drawings) for the waste management unit, a QA/QC report with a written summary of the QA/QC program and all test results and analyses, and a certification.

16. The discharger shall operate the waste management facility so as to prevent a statistically significant increase to exist between water quality at the point of compliance as provided in Section 2550.5, Article 5 of Chapter 15 and Water Quality Protection Standards (WQPS) to be established. The discharger shall establish these WQPS and a statistical methodology to evaluate water quality monitoring data according to the requirements of this Order and Article 5 of Chapter 15 within one year of adoption of this order.

17. In the event of a release of a constituent of concern beyond the Point of Compliance, the site will begin a Compliance Period pursuant to Section 2550.6(a). During the Compliance Period, the discharger shall perform an Evaluation Monitoring Program and a Corrective Action Program.

18. The discharger shall install any reasonable additional groundwater and leachate monitoring devices required to fulfill the terms of any Discharge Monitoring Program issued by the Executive Officer.

19. Interim cover shall be maintained over all waste, at all times, except for the active face area of the disposal as

approved by the California Integrated Waste Management Board.

20. Methane and other landfill gases shall be adequately vented, removed from the landfill units, or otherwise controlled to minimize the danger of explosion, adverse health effects, nuisance conditions, or the impairment of beneficial uses of water due to migration through the vadose (unsaturated) zone in accordance with applicable regulatory requirements.

21. This Board considers the property owner and site operator to have continuing responsibility for correcting any problems which arise in the future as a result of this waste discharge or related operations during the active life and post-closure maintenance period.

22. The discharger shall maintain all devices or designed features, installed in accordance with this Order such that they continue to operate as intended without interruption as provided for by the performance standards adopted by the California Integrated Waste Management Board.

23. The discharger shall provide a minimum of two permanent surveyed monuments near the landfill from which the location and elevation of wastes, containment structures, and monitoring facilities can be determined throughout the operation and post-closure maintenance period. These monuments shall be installed by a licensed land surveyor or registered civil engineer.

24. The Regional Board shall be notified immediately of any failure occurring in the waste management unit. Any failure which threatens the integrity of containment features or the landfill shall be promptly corrected after approval of the method and schedule by the Executive Officer.

25. The discharger shall notify the Regional Board at least 180 days prior to beginning any intermediate or final closure activities. This notice shall include a statement that all closure activities will conform to the most recently approved closure plan and that the plan provides for site closure in compliance with all applicable regulations.

26. The discharger shall submit, within 90 days after the closure of any portion of the landfill, a closure certification report which documents that the area has been closed according to the requirements of this Order and Chapter 15. The discharger shall certify under penalty of perjury that all closure activities were performed in accordance with the most recently approved

closure plan and in accordance with all applicable regulations.

27. The discharger shall comply with all applicable provisions of Chapter 15 and Subtitle D of the Resource Conservation and Recovery Act (Title 40 Part 258, Code of Federal Regulations) that are not specifically referred to in this Order.

C. PROVISIONS

1. The discharger shall comply with all Prohibitions, Specifications, and Provisions of this Order, immediately upon adoption of this Order or as provided below.

2. At least one month prior to commencement of filling of a specific area of the site the discharger shall submit a report indicating compliance with all Prohibitions, Specifications, and Provisions of this Order. This shall include as-built construction diagrams. Filling of the area described in the report shall not commence until the Executive Officer approves this report based on its demonstration of compliance with this Order.

   REPORT DUE DATE: 30 DAYS PRIOR TO FILL COMMENCEMENT

3. The discharger shall continue to submit quarterly monitoring reports in accordance with the attached updated Discharge Monitoring Program.

4. The discharger shall submit a detailed **Post Earthquake Inspection and Corrective Action Plan** acceptable to the Executive Officer to be implemented in the event of any earthquake generating ground shaking of Richter Magnitude 7 or greater at or within 30 miles of the landfill. The report shall describe the containment features, and ground water monitoring and leachate control facilities potentially impacted by the static and seismic deformations of the landfill. The plan shall provide for reporting results of the post earthquake inspection to the Board within 72 hours of the occurrence of the earthquake. Immediately after an earthquake event causing damage to the landfill structures, the corrective action plan shall be implemented and this Board shall be notified of any damage.

   REPORT DUE DATE: WITHIN THREE MONTHS OF ADOPTION OF THIS ORDER

5. The discharger shall submit to this Board and to the California Integrated Waste Management Board, evidence of an **Irrevocable Closure Fund** or provide other means to

ensure closure and post-closure maintenance of the waste management unit, pursuant to Section 2580(f) of Chapter 15. The Closure Fund must provide sufficient funds to properly close the landfill and for the post-closure monitoring, leachate management, and maintenance of the site. For the purposes of planning the amount of the fund, the discharger shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.

REPORT DUE DATE: WITHIN THREE MONTHS OF ADOPTION OF THIS ORDER

6. The discharger shall submit **Final Construction Details** acceptable to the Executive Officer pursuant to the specifications of this Order. The proposal should provide work plans for development of the various components of the landfill, including detailed specifications for construction of composite liners and leachate collection and removal systems and should include Quality Assurance & Quality Control Procedures, (QA/QC), for all aspects of construction and installation. The work plans for construction of the liners and the leachate collection and recovery system should include detailed specifications regarding the sequence of construction of the various segments of the project, and provide sufficient detail about how the various cells and modules of the landfill areas will interface structurally. The Final Construction Details must be determined to be consistent with this Order by the Executive Officer prior to acceptance of waste.

7. The discharger shall submit an updated geologic map as described in Specification B.9 as new waste management units are constructed. Prior to the placement of refuse in the unit, a detailed written description of the mapping procedure must be submitted and approved by the Executive Officer. The discharger shall evaluate each fracture zone, veins, shear zones and other macro or micro geologic deformations.

REPORT DUE DATE: 30 DAYS AFTER THE SUBGRADE PREPARATION IS COMPLETED

8. The discharger shall submit a **Contingency Plan** to be instituted in the event of a leak or spill from the leachate facilities. The discharger shall give immediate notification to the San Francisco Bay Regional Water Quality Control Board, the Local Enforcement Agency (LEA), and the California Department of Toxic Substance Control. The discharger shall initiate its corrective action plan to stop and contain the migration of pollutants from the site.

REPORT DUE DATE: WITHIN THREE MONTHS OF ADOPTION OF THIS ORDER

9. The discharger shall file with the Regional Board Discharge Monitoring Reports prepared under the supervision of a registered civil engineer or registered geologist performed according to any **Discharge Monitoring Program** issued by the Executive Officer.

10. The reports pursuant to these Provisions shall be prepared under the supervision of a registered engineer or certified engineering geologist.

11. The discharger shall remove and relocate any wastes which are discharged after the date of adoption of this Order in violation of these requirements.

12. The discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of the waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries of the disposal areas or the ownership of the site.

13. The discharger shall immediately notify the Board of any flooding, equipment failure, slope failure, or other change in site conditions which could impair the integrity of waste or leachate containment facilities or precipitation and drainage control structures.

NOTIFICATION: IMMEDIATELY
REPORT DUE DATE: WITHIN 7 DAYS AFTER THE INCIDENT

14. The discharger shall maintain a copy of this Order at the site so as to be available at all times to site operating personnel.

15. This Board considers the property owner and site operator to have continuing responsibility for correcting any problems which may arise in the future as result of this waste discharge or related operations.

16. The discharger shall permit the Board or its authorized representative, upon presentation of credentials:

    a. Immediate entry upon the premises on which wastes are located or in which any required records are kept.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order or by any other California State Agency.

d. Sampling of any discharge or ground water governed by this Order.

17. This Order updates Order No. 85-47.

18. These requirements do not authorize commission of any act causing injury to the property of another or of the public; do not convey any property rights; do not remove liability under federal, state or local laws; and do not authorize the discharge of wastes without appropriate permits from other agencies or organizations.

19. All requirements of the Federal municipal solid waste regulations (Title 40, Code of Federal Regulations [CFR], parts 257 and 258) are to be implemented as the requirements become effective or sooner as required by this Order.

20. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations, policies, or guidelines; changes in the Board's Basin Plan; or changes in the discharge characteristics.

I, Steven R. Ritchie Executive Officer, do hereby certify that the foregoing is a full, complete, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 16, 1993.

Steven R. Ritchie
Executive Officer

Attachments:
1. Figures:
   1. Site Location Map
   2. Existing Topography and Site Plan
   3. Fill Area Locations
   4. Earthquake Sources (Fault) Location Map
   5. Cells 2 and 5 Subdrain Collection System
   6. Typical Subdrain Section (Composite liner)
   7. Typical Subdrain and Leachate Collector at Bench (Side Slopes)
   8. Typical Liner Cross-Section
   9. Cells 2 and 5 LCRS Plan
2. Table 1. Geologic characteristics of potential earthquake sources.
3. Discharge Monitoring Program

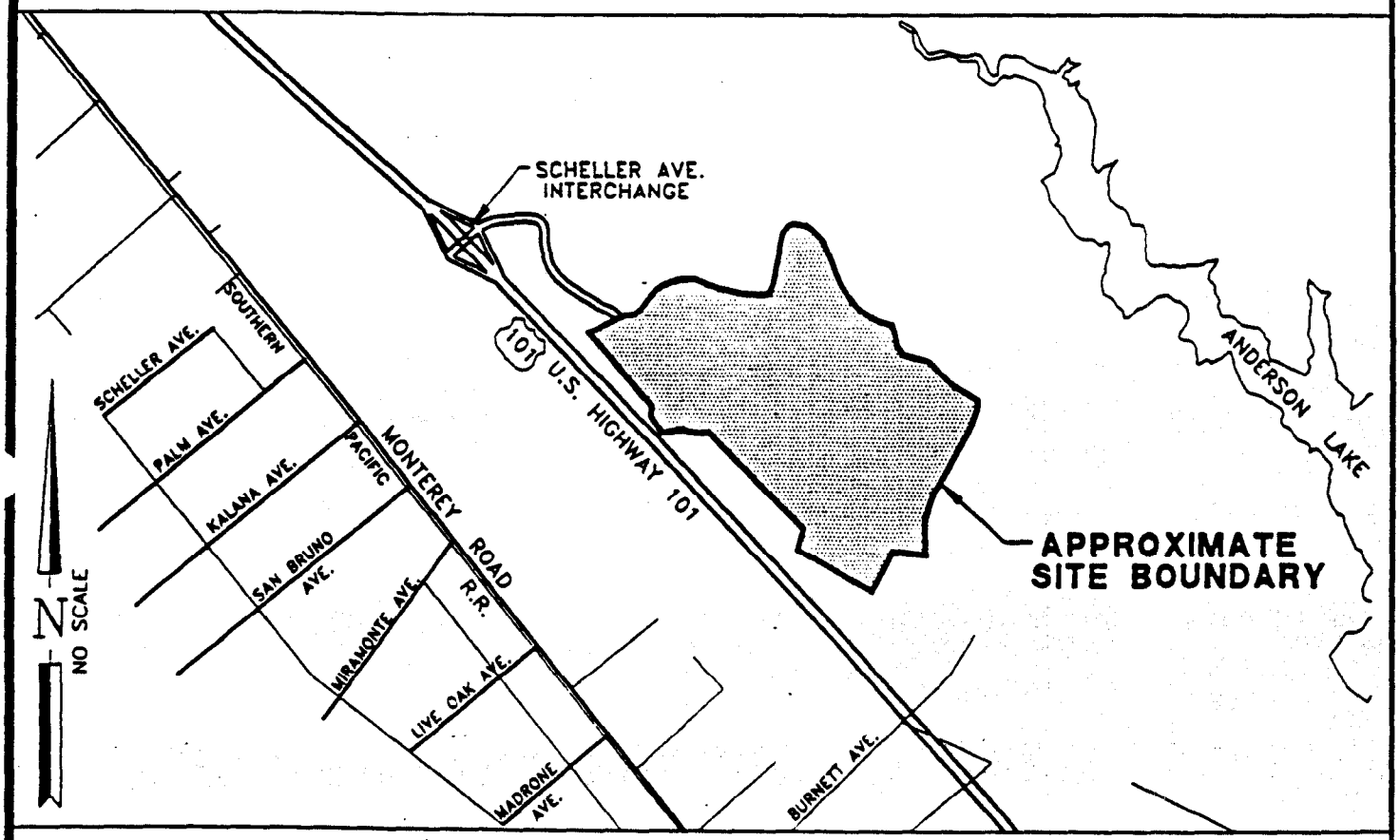


FIGURE 1

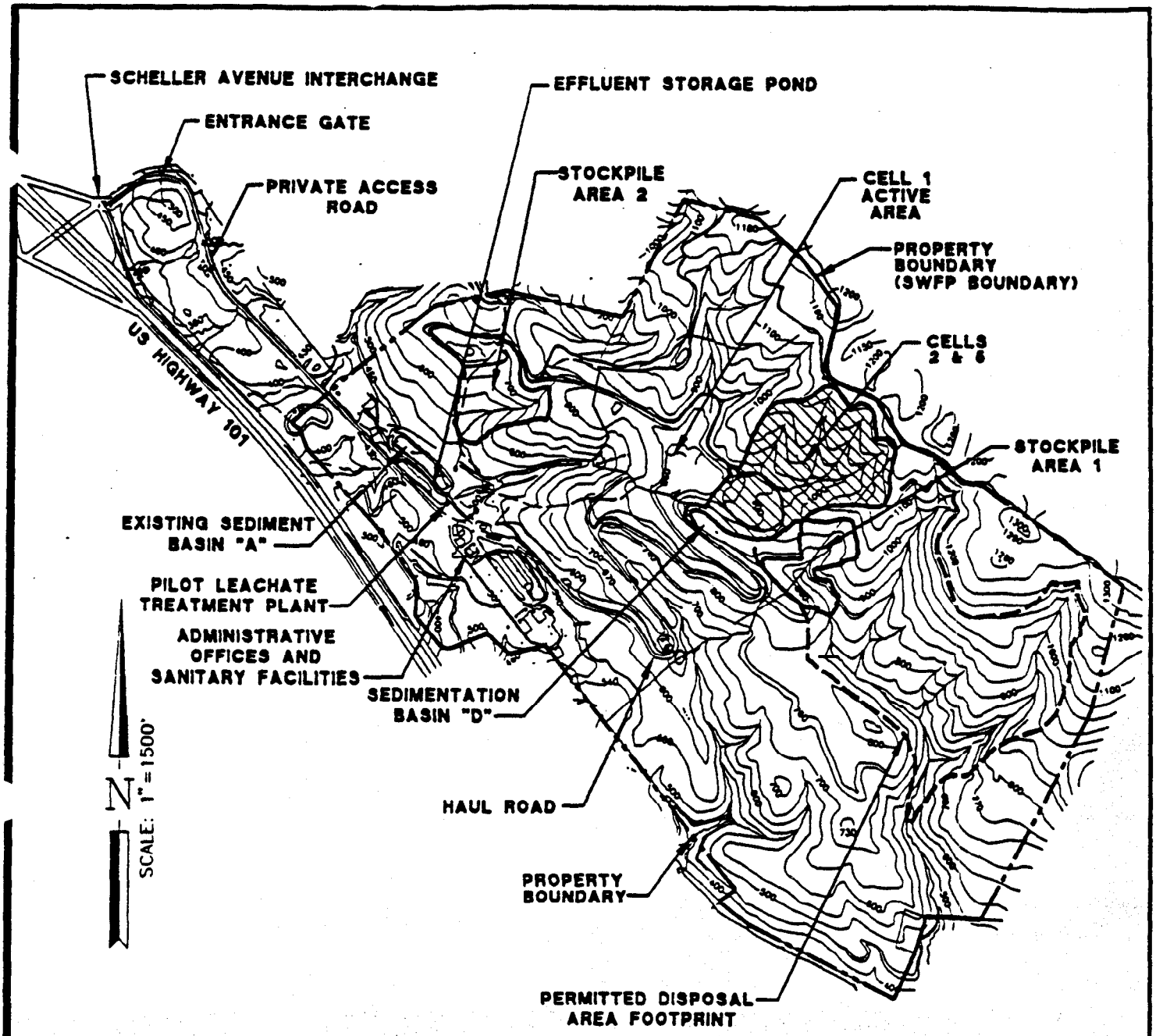
SITE LOCATION MAP

KIRBY CANYON R & DF

BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

REFERENCE :
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 2-2.

NAME: I:\11\65\DWG DATE: FEB 01, 1993 TIME: 3:06 PM



REFERENCE:
FEBRUARY 1993 REPORT OF DESIGN CELLS 2 AND 5, FIGURE 2-3.

NOTE:
PROPERTY BOUNDARY AND SOLID WASTE FACILITIES PERMIT (SWFP) BOUNDARY ARE IDENTICAL.

FIGURE 2

EXISTING TOPOGRAPHY AND SITE PLAN

KIRBY CANYON R & DF

BAS BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

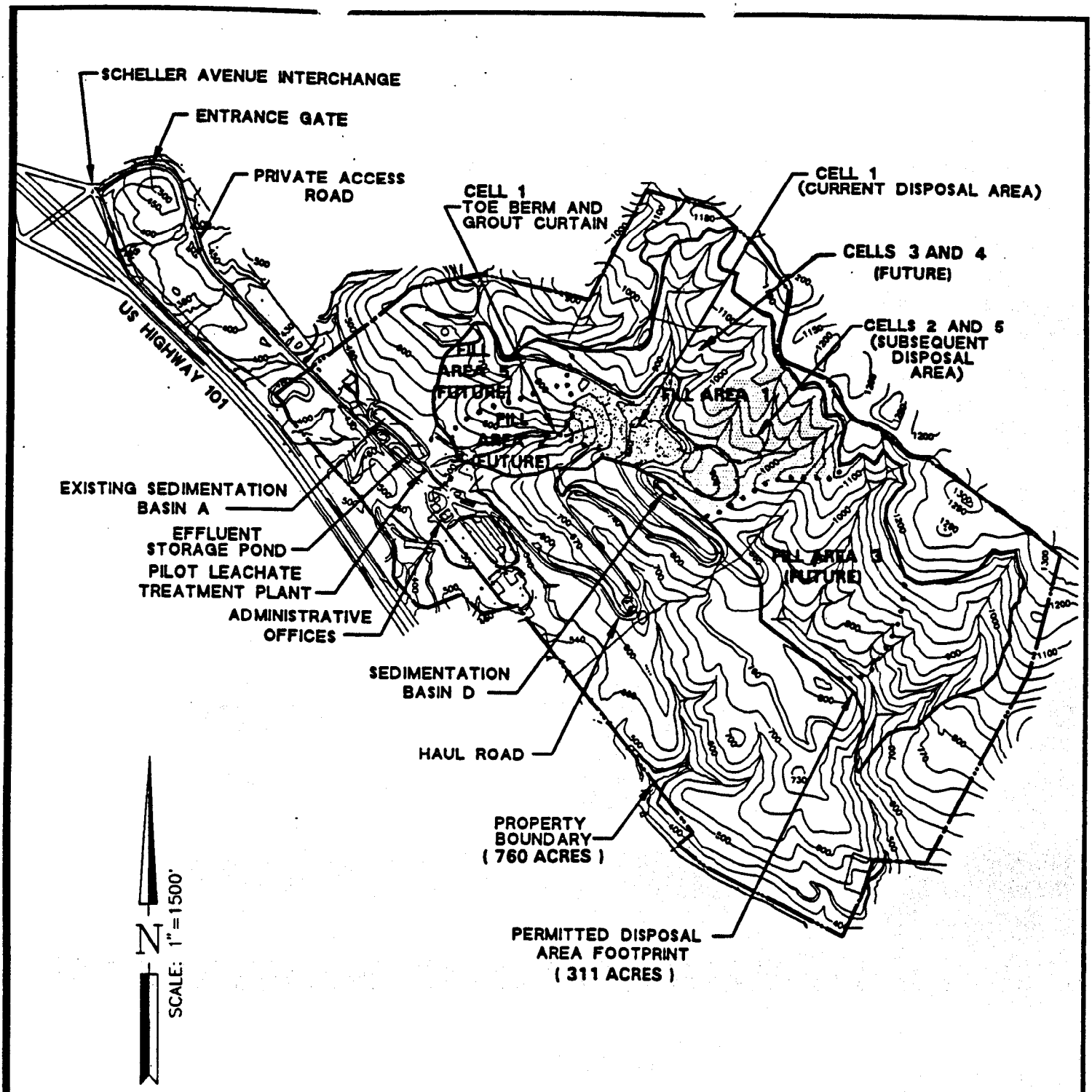


FIGURE 3

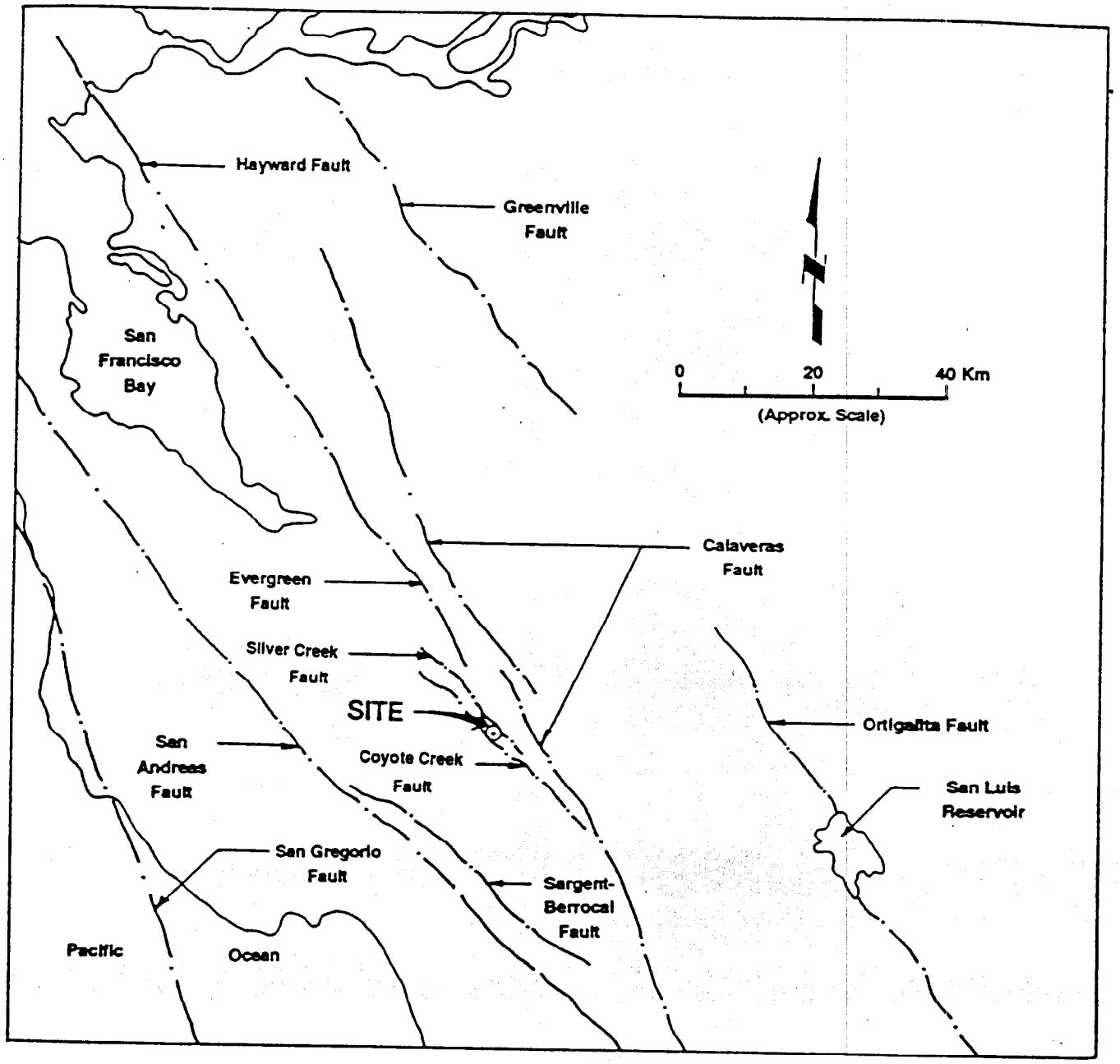
LEGEND

• • • • • APPROXIMATE FILL AREA BOUNDARY

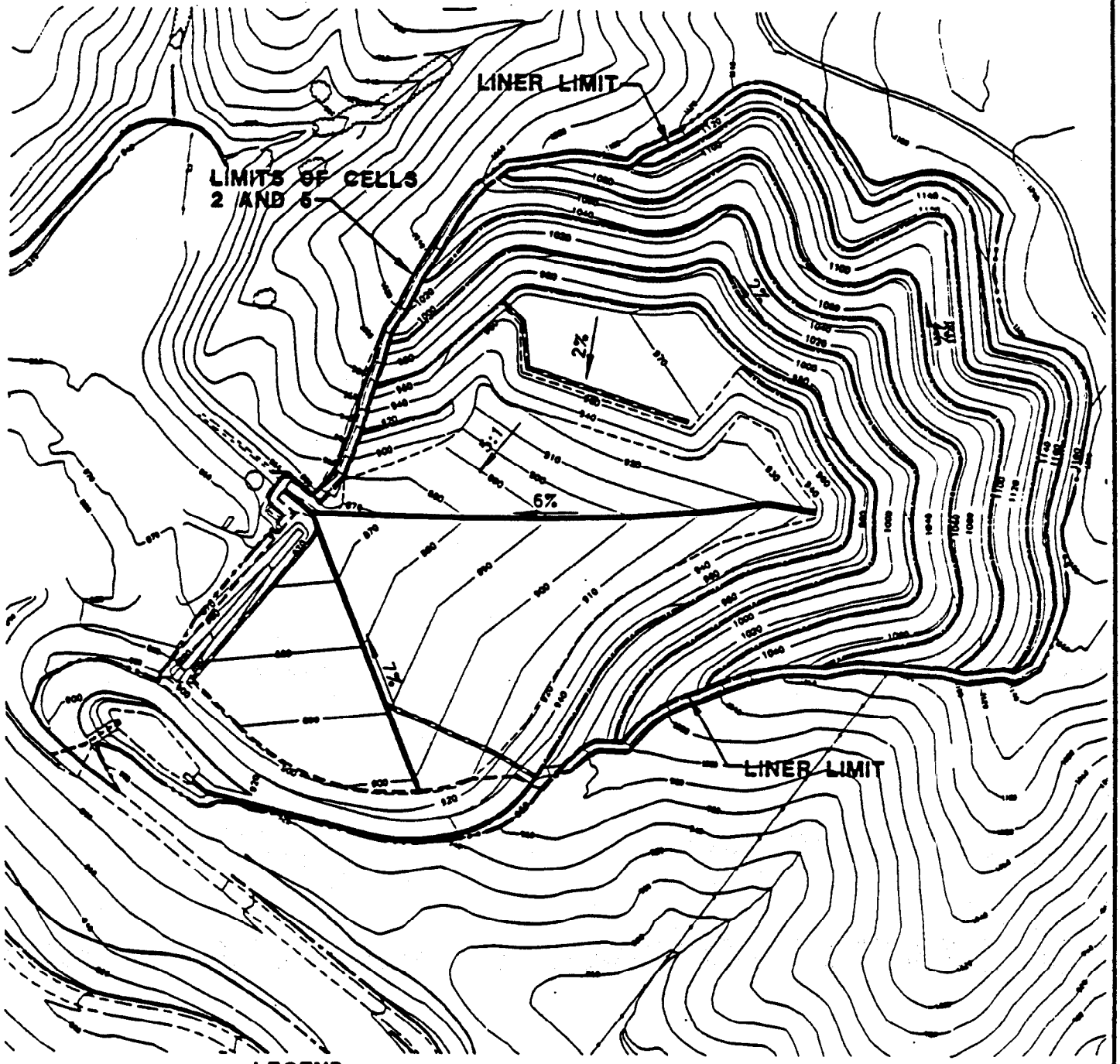
FILL AREA LOCATIONS

KIRBY CANYON RECYCLING & DISPOSAL FACILITY

NAME: 1705758.DWG DATE: APR 16, 1993 TIME: 4:33 PM



Job No. 923-7046	Scale As Shown	EARTHQUAKE SOURCE (FAULT) LOCATION MAP	
Drawn DVR	Date Feb. 1993		
Checked DOW	Dwg. No. OAK0002103		
Golder Associates		BAS/Cells 2 and 5/CA	FIGURE 4



LEGEND

7%	DIRECTION OF FLOW AND RATE OF SLOPE
	EXISTING CONTOUR
	FINISHED CONTOUR
	SUBDRAIN MAIN LINE
	LATERAL SUBDRAIN COLLECTOR
	TOEDRAIN BENCH LINE
	LINER LIMIT CELLS 2 AND 5
	LIMITS OF CELLS 2 AND 5 EXCAVATION

N

SCALE: 1" = 300'

REFERENCE :
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 3-2.

FIGURE 5

CELLS 2 AND 5 SUBDRAIN COLLECTION SYSTEM

KIRBY CANYON R & DF

BAS BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

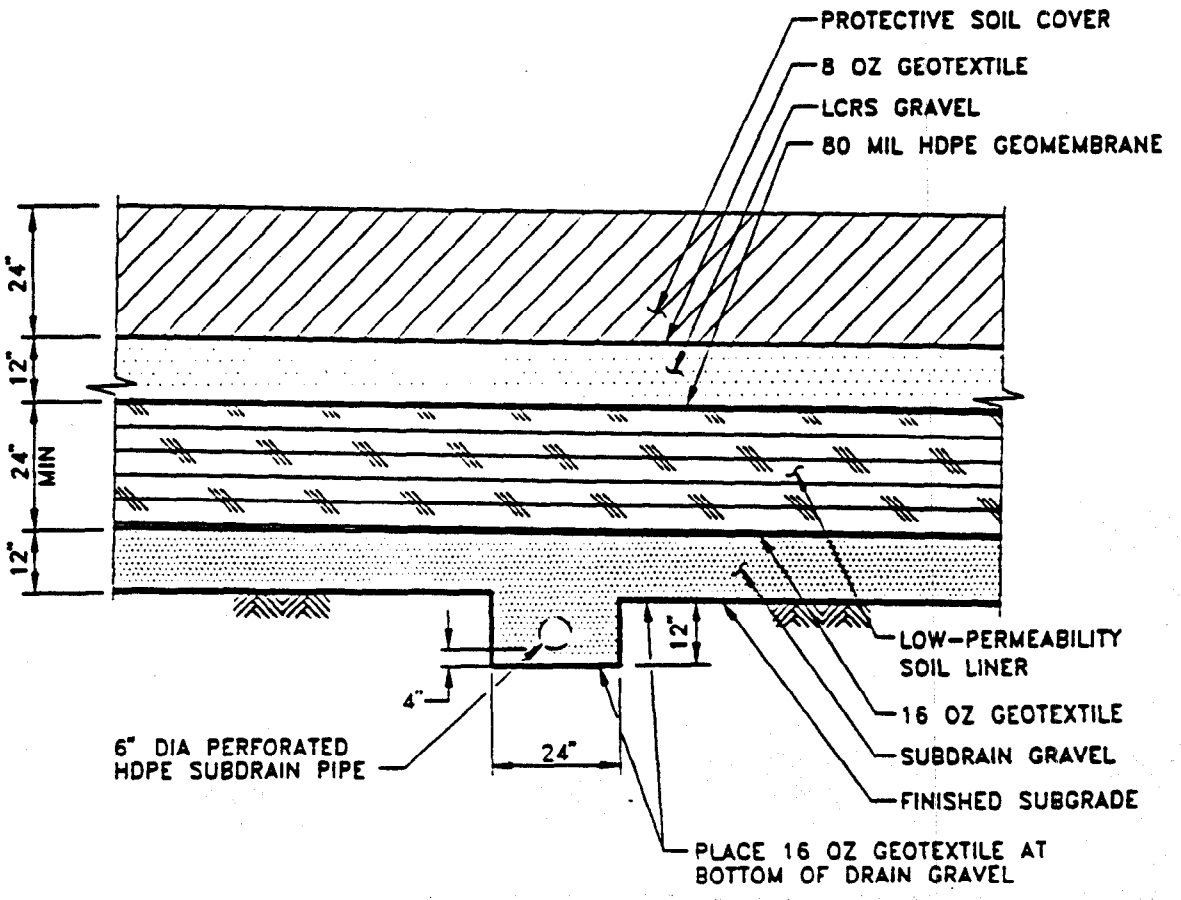


FIGURE 6

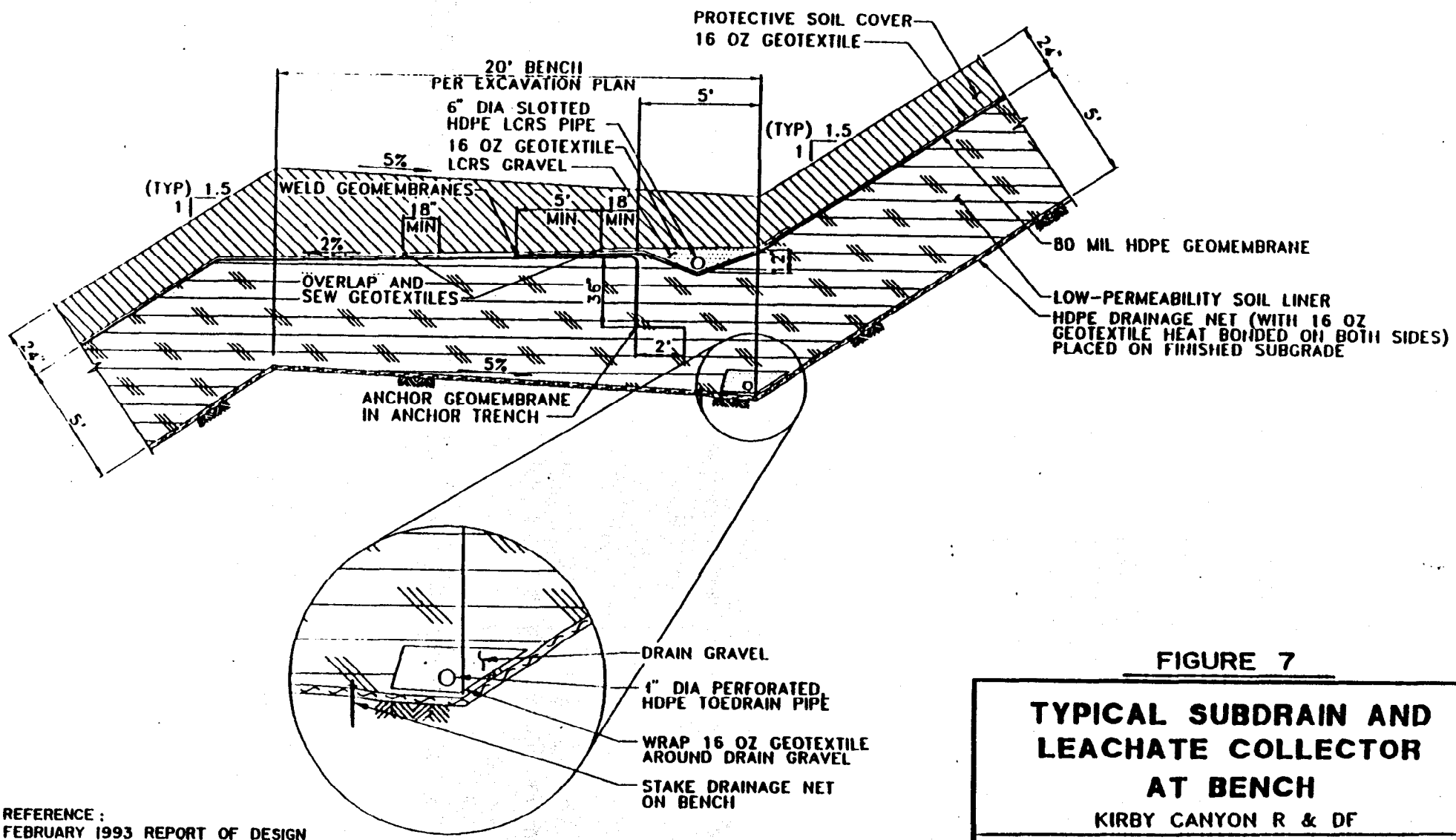
TYPICAL SUBDRAIN SECTION

KIRBY CANYON R & DF

BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

REFERENCE :
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 3-3.

1702458



REFERENCE :
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 3-4.

FIGURE 7

TYPICAL SUBDRAIN AND LEACHATE COLLECTOR AT BENCH

KIRBY CANYON R & DF

BAS BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

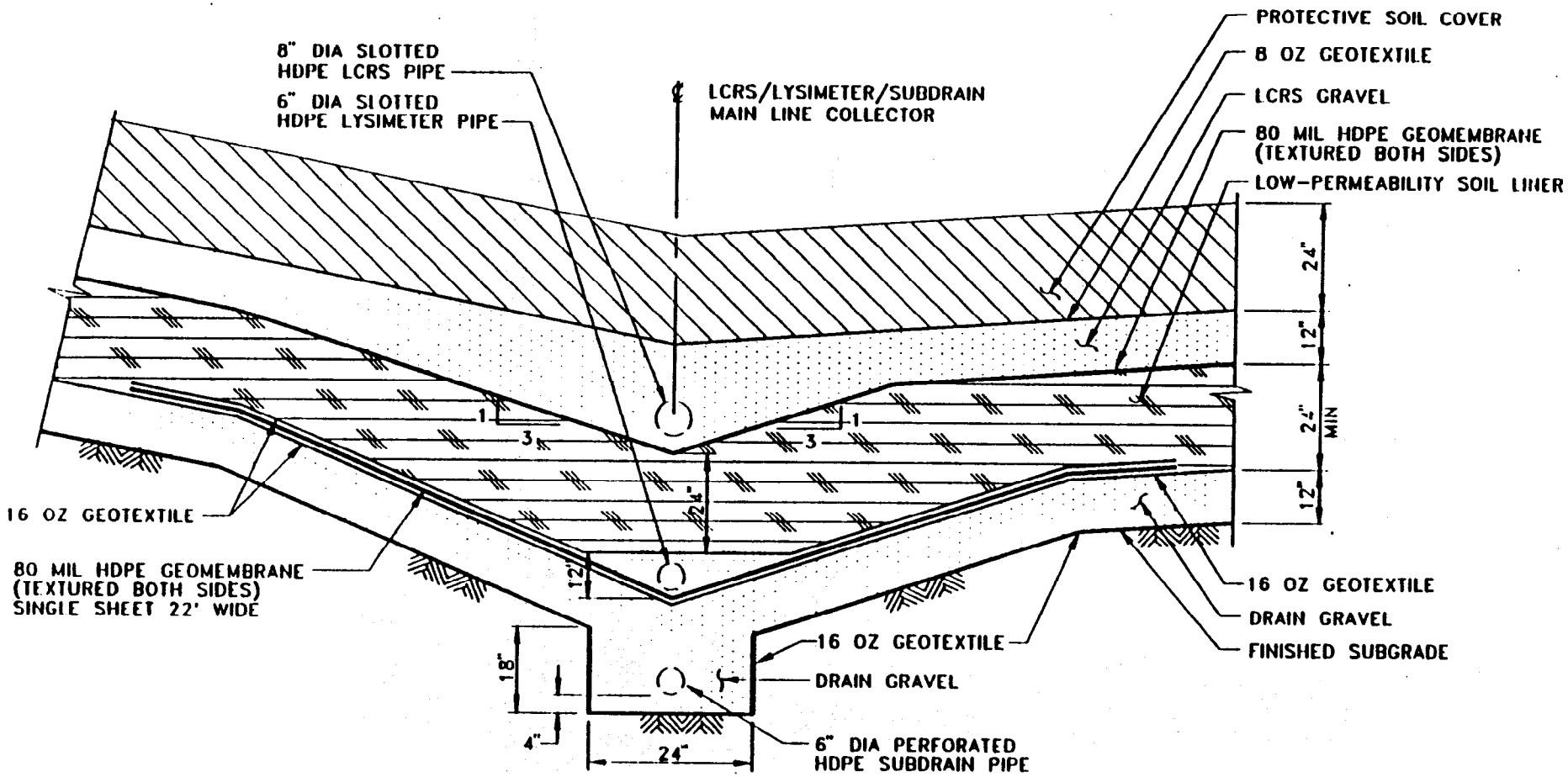


FIGURE 8

TYPICAL LINER CROSS SECTION

KIRBY CANYON R & DF

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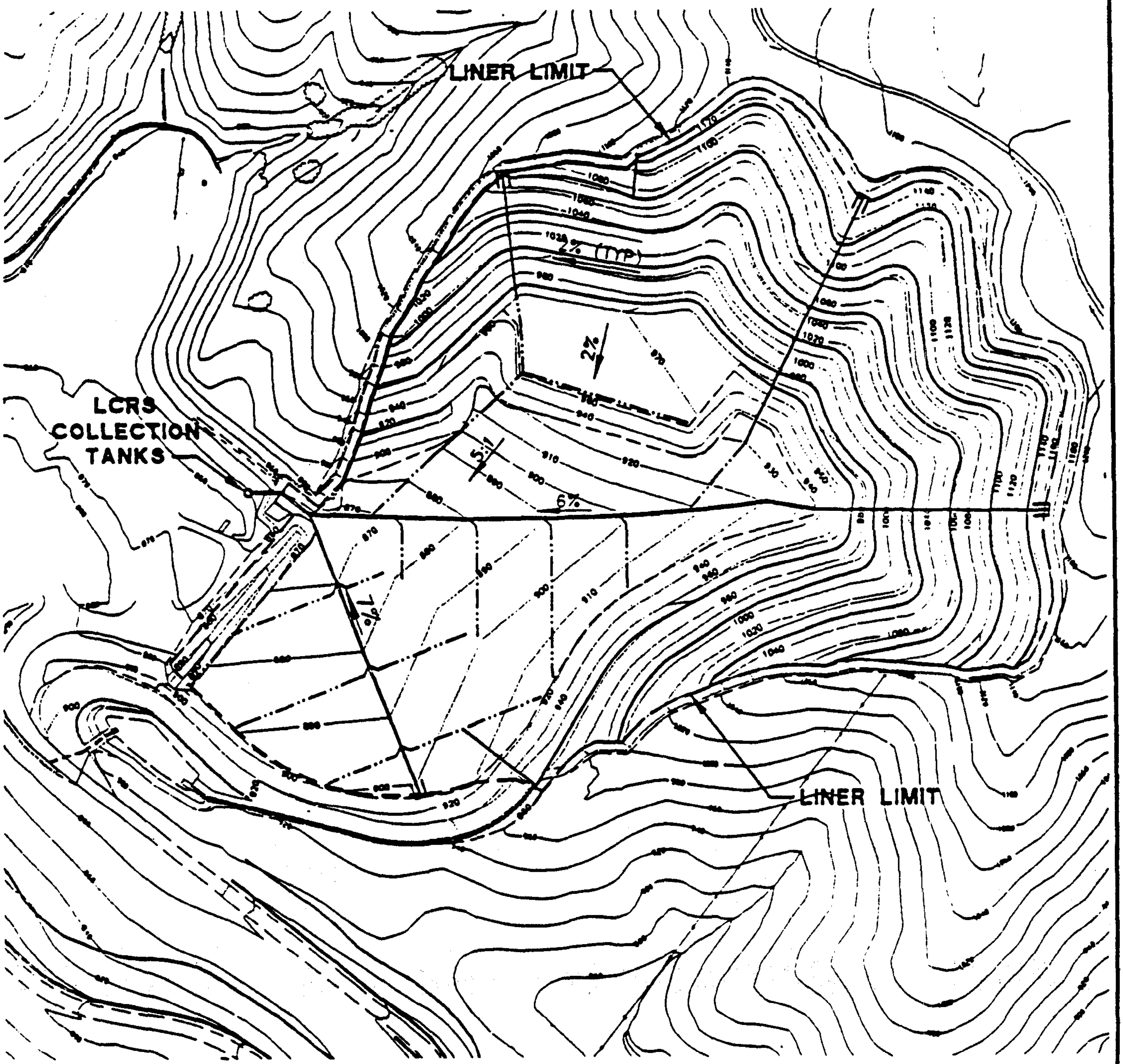
CIVIL AND ENVIRONMENTAL ENGINEERS

REFERENCE:
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 3-8.



LEGEND

7%	DIRECTION OF FLOW AND RATE OF SLOPE
	LCRS CLEANOUT
	EXISTING CONTOUR
	FINISHED CONTOUR
	LCRS MAIN LINE
	LCRS LATERAL LINE
	LCRS BENCH LINE/ CLEANOUT RISER
	LINER LIMIT CELL 2 AND 5

SCALE: 1"=300'

REFERENCE :
FEBRUARY 1993 REPORT OF DESIGN
CELLS 2 AND 5, FIGURE 3-7.

FIGURE 9

CELLS 2 AND 5 LCRS PLAN

KIRBY CANYON R & DF

BAS BRYAN A. STIRRAT & ASSOCIATES
CIVIL AND ENVIRONMENTAL ENGINEERS

Project: BAS/CELLS 2 AND 5/CA

Our Ref: 903-7046.210

Prepared by: D.O. West

Date: January 5, 1993

File: b:\7046tb1.wk1

TABLE 1. GEOLOGIC CHARACTERISTICS OF POTENTIAL EARTHQUAKE SOURCES

Potential Earthquake(1) Source	Distance (2) km	Length, km	Slip Rate mm/yr	MCE(3)	Recurrence of MCE, yrs	Sources(4)
Coyote Creek Fault (r)	1.0	18–26	4	Me 6.7	264	Contra Costa County (1986), EMCON (1983,1989), Golder Associates Inc. (1990), Jennings (1975, 1985), Slemmons (1982), Slemmons and Chung (1982), USGS (1988b), Weaverousky (1986), and Wright et al (1982).
Silver Creek Fault (r)	1.0	33	4	Me 6.8	264	
Calaveras Fault (rl) (H)	3.0	110–160	7	Me 7.2	150	
Evergreen Fault (r)	10.0	20–25	4	Me 7.0	335	
Sargent–Berrocal Fault (rr)	15.0	46–51	1	Me 7.1	—	
San Andreas Fault (rl) (H)	19.0	1100	12	Me 8.5	140–300	
Ortigalita Fault (rl) (H)	33.0	82	0.01–0.04	Me 6.7	10,000	
Hayward Fault (rl) (H)	44.0	110	4–8	Me 7.2	264–556	
Greenville Fault (rl) (H)	52.0	94	0.1–0.9	Me 7.0	1,200–3,300	
San Gregorio Fault (rl) (H)	56.0	190	7.0	Me 7.7	824	

Notes: (1) The fault type and age of displacement are indicated by: r = reverse fault, rr = right reverse fault, rl = right lateral strike slip fault, H = fault with Holocene and/or historic activity.

(2) Closest horizontal distance from source to site.

(3) Me = surface wave magnitude.

(4) One or more sources used to obtain data for each column and line of the table.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

DISCHARGE MONITORING PROGRAM

FOR

WASTE MANAGEMENT OF CALIFORNIA, INC.
KIRBY CANYON RECYCLING & DISPOSAL FACILITY
CLASS III SOLD WASTE DISPOSAL SITE

SANTA CLARA COUNTY

ORDER NO. 93-055

CONSISTS OF

PART A

AND

PART B

PART A

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16. This Discharge Monitoring Program is issued in accordance with Provision C.9 of Regional Board Order No. 93-.

The principal purposes of a discharge monitoring program are: (1) to document compliance with waste discharge requirements and prohibitions established by the Board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of standards of performance, and toxicity standards, (4) to assist the discharger in complying with the requirements of Article 5, Chapter 15 as revised July 1, 1991.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the most recent version of EPA Standard Methods and in accordance with an approved sampling and analysis plan.

Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.

2. Receiving waters refers to any surface water which actually or potentially receives surface or groundwater which pass over, through, or under waste materials or contaminated soils. In this case, the groundwater beneath and adjacent to the landfill areas and the surface runoff from the site are considered receiving waters.

3. Standard observations refer to:

   a. Receiving Waters

      1) Floating and suspended materials of waste origin: presence or absence, source, and size of affected area.
      2) Discoloration and turbidity: description of color, source, and size of affected area.
      3) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
      4) Evidence of beneficial use: presence of water associated wildlife.
      5) Flow rate.
      6) Weather conditions: wind direction and estimated velocity, total precipitation during the previous five days and on the day of observation.

   b. Perimeter of the waste management unit

      1) Evidence of liquid leaving or entering the waste management unit, estimated size of affected area and flow rate. (Show affected area on a map.)
      2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.
      3) Evidence of erosion and/or daylighted refuse.

   c. The waste management unit

      1) Evidence of ponded water at any point on the waste management facility.
      2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source
      3) Evidence of erosion and/or daylighted refuse.
      4) Standard Analysis (SA) and measurements are listed on Table 2 (attached).

D. SAMPLING, ANALYSIS, AND OBSERVATIONS

The discharger is required to perform sampling, analyses, and observations in the following media:

1. Groundwater per Section 2550.7(b)
2. Surface water per Section 2550.7(c) and per the general requirements specified in Section 2550.7(e) of Article 5,

Chapter 15 and
3. Vadose zone per Section 2550.7(d).

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the discharger or laboratory, and shall be retained for a minimum of five years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.

2. Date and time of sampling.

3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.

4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used.

5. Calculation of results.

6. Results of analyses, and detection limits for each analysis.

F. REPORTS TO BE FILED WITH THE BOARD

1. Written detection monitoring reports shall be filed by the 15th day of the month following the report period. In addition, an annual report shall be filed as indicated in F.3 below. The reports shall be comprised of the following:

a. Letter of Transmittal

A letter transmitting the essential points in each report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the last report period, and actions taken or planned for correcting the violations. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period, this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the

level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge, the report is true, complete, and correct.

b. Each monitoring report shall include a compliance evaluation summary. The summary shall contain:

1) A graphic description of the velocity and direction of groundwater flow under/around the waste management unit, based upon the past and present water level elevations and pertinent visual observations. A statistical evaluation of the water quality monitoring data for all groundwater compliance points.

2) The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field PH, temperature, and conductivity during purging, calibration of the field equipment, results of the PH, temperature conductivity and turbidity testing, well recovery time, and method of disposing of the purge water.

3) Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations.

c. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.

d. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory

and shall sign all reports of such work submitted to the Board.

1) The methods of analyses and detection limits must be appropriate for the expected concentrations. Specific methods of analyses must be identified. If methods other that EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and approval by the Executive Officer prior to use.

2) In addition to the results of the analyses, laboratory quality assurance/quality control (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; and explanation for any recovery rate that is less than 80%; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

e. An evaluation of the effectiveness of the leachate monitoring or control facilities, which includes an evaluation of leachate buildup within the disposal units, a summary of leachate volumes removed from the units, and a discussion of the leachate disposal methods utilized.

f. A summary and certification of completion of all standard observations for the waste management unit, the perimeter of the waste management unit, and the receiving waters.

g. The quantity and types of wastes disposed of during the past quarter, and the locations of the disposal operations.

2. CONTINGENCY REPORTING

a. A report shall be made by telephone of any seepage from the disposal area immediately after it is discovered. A written report shall be filed with the Board within five days thereafter. This report shall contain the following information:

1) a map showing the location(s) of discharge;
2) approximate flow rate;

3) nature of effects; i.e., all pertinent observations and analyses; and
4) corrective measures underway or proposed.

b. A report shall be made in writing to the Board within seven days of determining that a statistically significant increase occurred between a down gradient sample and a WQPS. Notification shall indicate what WQPS(s) has/have been exceeded. The discharger shall immediately resample at the compliance point where this difference has been found and reanalyze.

c. If resampling and analysis confirms the earlier finding of a statistically significant increase between monitoring results and WQPS(s), the discharger must submit to the Board an amended Report of Waste Discharge as specified in Section 2550.8(k)(5) for establishment of an Evaluation Monitoring Program (EMP) meeting the requirements of Section 2550.9 of Chapter 15.

d. Within 180 days of determining statistically significant evidence of a release, submit to the regional board an engineering feasibility study for a Corrective Action Program (CAP) necessary to meet the requirements of Section 2550.10. At a minimum, the feasibility study shall contain a detailed description of the corrective action measures that could be taken to achieve background concentrations for all constituents of concern.

3. REPORTING

By January 31 of each year, the discharger shall submit an annual report to the Board covering the previous calendar year. This report shall contain:

a. Tabular and graphical summaries of the monitoring data obtained during the previous year; the report should be accompanied by a 5-1/4" computer data disk, MS-DOS ASCII format, tabulating the year's data.

b. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.

c. A map showing the area, if any, in which filling has been completed during the previous calendar year.

d. A written summary of the groundwater analyses indicating any change in the quality of the groundwater

e. An evaluation of the effectiveness of the leachate monitoring/control facilities, which includes an evaluation of leachate buildup within the disposal units, a summary of leachate volumes removed from the units, and a discussion of the leachate disposal methods utilized.

4. WELL LOGS

A boring log and a monitoring well construction log shall be submitted for each sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 30 days after well installation.

PART B

1. DESCRIPTION OF OBSERVATION STATIONS AND SCHEDULE OF OBSERVATIONS

A. WASTE MONITORING - Report Quarterly

1. Record the total volume and weight of refuse in cubic yards and tons disposed of at the site during each month. Show locations and dimensions on a sketch or map.

2. Record a description of waste stream to include percentage of waste type, i.e., Residential, Commercial, Industrial or Construction debris.

3. Record location and aerial extent of disposal of each waste type.

B. ON-SITE OBSERVATIONS - Report Quarterly

STATION	DESCRIPTION	OBSERVATIONS	FREQUENCY
V-1 thru V-'n'	Located on the waste disposal area as delineated by a 500 foot grid network.	Standard observations for the waste management unit.	Weekly
P-1 thru P-'n' (perimeter)	Located at equidistant intervals not exceeding 1000 feet around the perimeter of the waste management unit.	Standard observations for the perimeter.	Weekly

C. GROUNDWATER AND SURFACE WATER MONITORING - Report Quarterly

Groundwater and surface water shall be monitored as outlined below and on Table 2 (Attached) and shown on Figure 1 and 2 (Attached). In addition, surface water shall be monitored in accordance with the National Pollutant Discharge Elimination System General Permit (Order No. 92-011 and 92-116). The groundwater parameters listed in Table 2 are to be monitored quarterly for a period of not less than one year. Subsequent to this one year monitoring period, the discharger shall propose for acceptance by the Board a selected subset of the Table 2 parameters as constituents of concern (COC) per Section 2550.3 of Chapter 15, and a selected subset of the parameters in the COC list as detection monitoring parameters per Section 2550.8 (e) of Chapter 15. The Criteria for selection of the detection monitoring parameters are detectability, persistence, existence in the site's leachate, mobility, and contrast to surrounding groundwater.

TABLE 1

Monitoring Points and Background Monitoring Points for Each Monitored Medium

MONITORING MEDIA	Compliance Point	Background Point
Surface Water	R01 (Existing Sedimentation Basin)	
Groundwater	(G-1, G-2, G-3)[1]	12A
Alluvium	TW-1, MW-A1, MW-A2, MW-A3	Intra-well
Weathered Bedrock (Serpentinite)	MW-WB1, MW-WB2	Intra-well
Subdrain	Collection Pipe Outlet	
Vadose Zone	Collection Lysimeter	
Leachate	L01, L02, L03	

Note 1. To be decommissioned with Board approval after the effects of the leachate pipe leak discovered in 1990 are eliminated from the system.

D. FACILITIES MONITORING

The discharger shall inspect all facilities to ensure proper and safe operation once per quarter and report quarterly. The facilities to be monitored shall include, but not be limited to:

a. Leachate collection and removal systems
b. Surface water impoundment
c. Vadose zone and subdrain collection systems
d. Perimeter diversion channels
e. Leachate management facilities and secondary containment.

I, Steven Ritchie Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 93-055

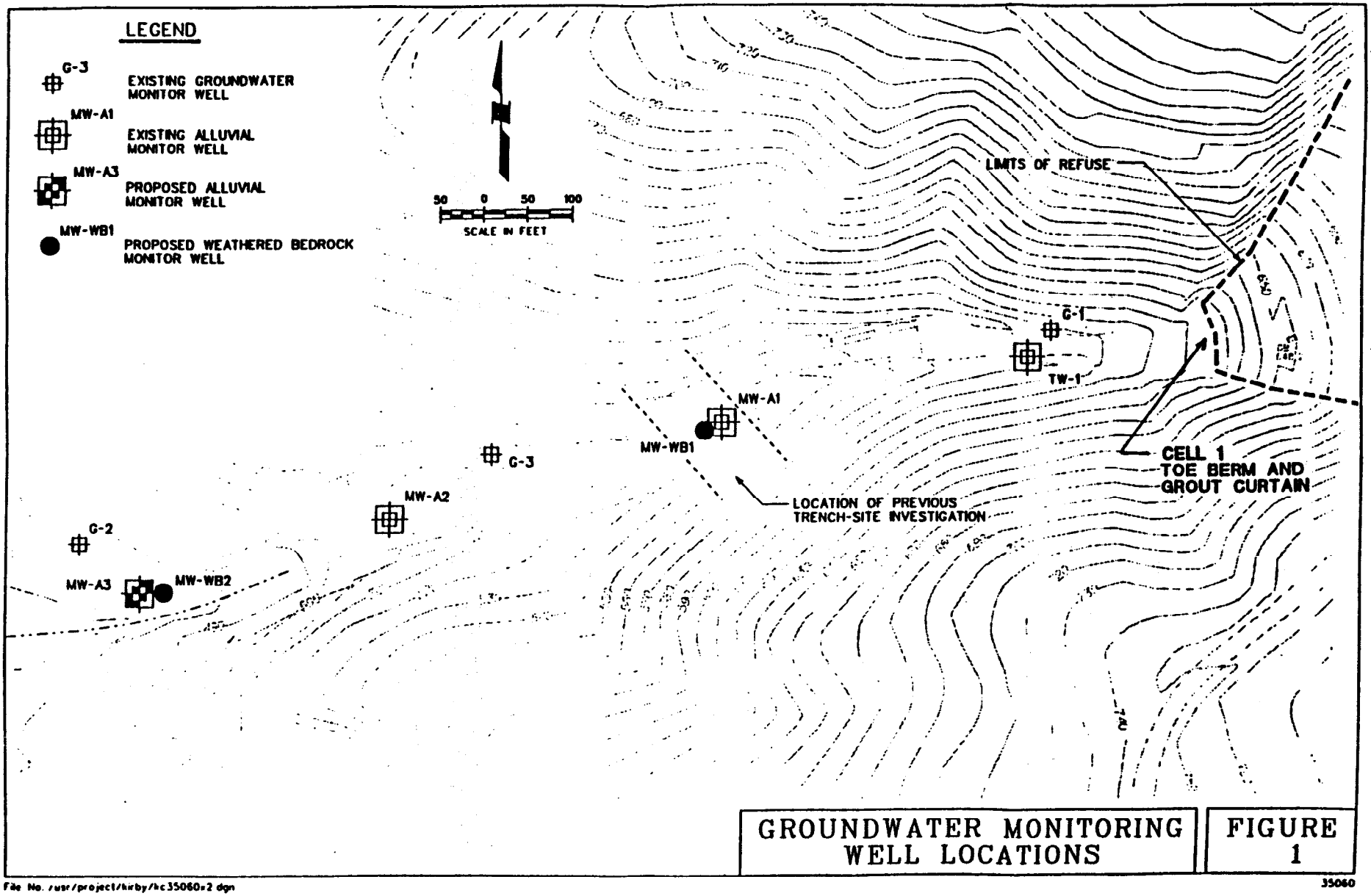
2. Is effective on the date shown below.

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer.

Steven R. Ritchie
Executive Officer

Date Ordered: June 16, 1993

Attachments:
Figure 1 - Groundwater Monitoring Well Locations
Figure 2 - Leachate and Surface Water Monitoring Locations
Table 2 - Schedule for Sampling, Measurement, and Analysis

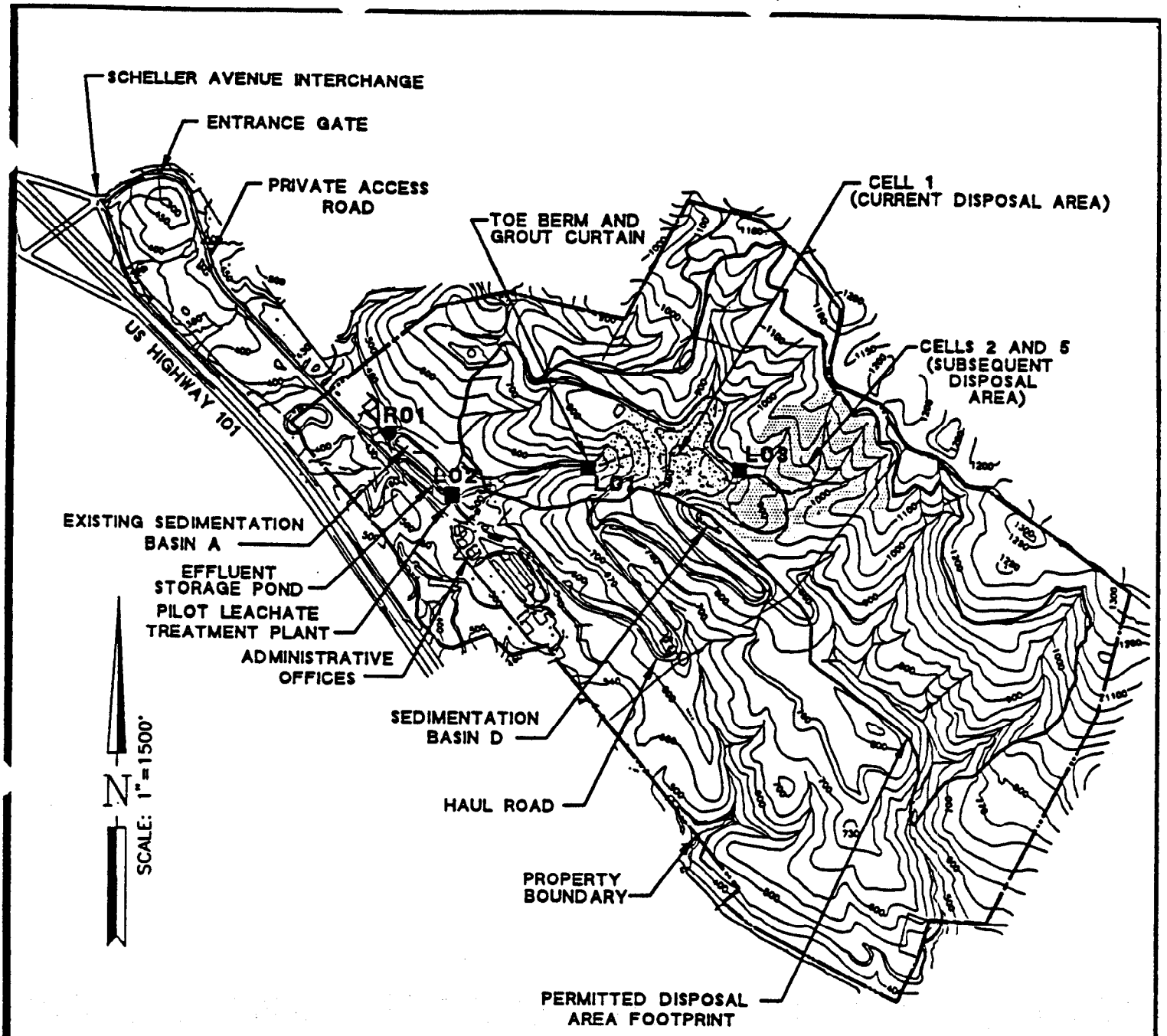


GROUNDWATER MONITORING WELL LOCATIONS

FIGURE 1

File No. /usr/project/kirby/hc35060x2.dgn

35060



LEGEND

■ **L01** LEACHATE COLLECTION POINT/LOCATION AND DESIGNATION

● **R01** SURFACE/STORMWATER RUN OFF MONITORING POINT

Leachate and Surface Water Monitoring Locations

FIGURE 2

NAME: 170575B.DWG DATE: MAR 10, 1993 TIME: 11:55 AM

TABLE 2

Discharge Monitoring Program, List of Analytical Parameters schdule for Sampling, Measurement, and Analysis

Parameters	Method	Frequency	Reference
Water level	Field	Monthly (a)	1
Temperature	Field	Monthly (a)	1
Water level in Sedimentation Basin	Field	Monthly (a)	1
Water level in all types of wells	Field	Monthly (a)	1
Alkalinity, bicarbonate	310.1	Quarterly	2
Alkalinity, carbonate	310.1	Quarterly	2
Alkalinity, hydroxide	310.1	Quarterly	2
Chemical Oxygen Demand	410.2	Quarterly	2
Chloride	9252	Quarterly	3
Ammonia nitrogen	350.3	Quarterly	2
Nitrate nitrogen	9200	Quarterly	3
Total kjeldahl nitrogen	351.4	Quarterly	2
Total Organic Carbon	415.1	Quarterly	2
Total phenols	9065	Annually	3
Total Dissolved Solids	160.1	Quarterly	2
Electrical Conductivity	9050	Quarterly	3
Total suspended solids	160.2	Quarterly	2
Turbidity	Field	Quarterly	1
Settle-able solids	160.5	Quarterly	2
Sulfate	9038	Quarterly(b)	3
Volatile Organic Compounds	8010/ 8020	Quarterly	3
Volatile Organic Compounds	8240	Quarterly	3
Semivolatile Organic Compounds	8270	Annually	3
Arsenic	6010	Quarterly	3

Fluoride	340.2	Quarterly	2
Calcium	6010	Quarterly	3
Cadmium	6010	Quarterly	3
Total Chromium	6010	Quarterly	3
Copper	6010	Quarterly	3
Magnesium	6010	Quarterly	3
Manganese	6010	Quarterly	3
Mercury	6010	Quarterly	3
Iron	6010	Quarterly	3
Lead	6010	Quarterly	3
Nickel	6010	Quarterly	3
Potassium	6010	Quarterly	3
Selenium	7740	Quarterly	3
Sodium	6010	Quarterly	3
Silver	6010	Quarterly	3
Zinc	6010	Quarterly	3
Dissolved Oxygen	Field	Quarterly	1
pH	Field	Quarterly	3
Fish bioassay (96 hour acute toxicity % of survival)	NA (5)	Quarterly (e)	4

1. Not Applicable
2. Methods for Chemical Analysis of Water and Wastes, EPA 600/4/79/029, revised March 1983.
3. EPA SW-846
4. Methods for Measuring the Acute Toxicity of Effluent to Freshwater and Marine Organism. EPA 600/4-85/013 April 1985, 3rd Edition
5. NA = Not Applicable

(a) monthly for first year, quarterly thereafter
(b) groundwater samples only
(c) surface water samples only
(d) instead of method 8010/8020 for one quarter per year
(e) surface water location R01 only

Fluoride	340.2	Quarterly	2
Calcium	6010	Quarterly	3
Cadmium	6010	Quarterly	3
Total Chromium	6010	Quarterly	3
Copper	6010	Quarterly	3
Magnesium	6010	Quarterly	3
Manganese	6010	Quarterly	3
Mercury	6010	Quarterly	3
Iron	6010	Quarterly	3
Lead	6010	Quarterly	3
Nickel	6010	Quarterly	3
Potassium	6010	Quarterly	3
Selenium	7740	Quarterly	3
Sodium	6010	Quarterly	3
Silver	6010	Quarterly	3
Zinc	6010	Quarterly	3
Dissolved Oxygen	Field	Quarterly	1
pH	Field	Quarterly	3
Fish bioassay (96 hour acute toxicity % of survival)	NA (5)	Quarterly (e)	4

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